Section 13 Contents

Section 13 State Water Plan - Cedar/Beaver Basin

Disaster and Emergency Response

13.1 Introduction

This section discusses flood hazard mitigation and disaster response related to possible predisaster or immediate actions at the time of the disaster to protect the water resources. It also describes programs and mechanisms now in place along with those needed.

It is generally inefficient to react to a disaster or emergency after it has occurred. This wastes time, money and other resources. There is also the possibility of loss of life and threats to health and welfare. Predisaster activities such as floodplain management, hazard mitigation and mitigation planning are the preferred approaches.

13.2 Background

All levels of government have the statutory authority to carry out disaster related programs, including pre- and post-disaster hazard activities. There is one problem. No one entity has all of the necessary authority to implement actions to mitigate a specific hazard or disaster. The *Utah State Water Plan* (1990)[21] discusses the specific authorities and assistance programs available to the various agencies. These are discussed in Section 3, Introduction; Section 13, Disaster and Emergency Response; and Section 16, Federal Water Planning and Development. The Division of Comprehensive Emergency Management (CEM) is responsible for disaster and emergency response at the state level while the Federal Emergency Management Agency and the Corps of Engineers are responsible at the federal level. Requests for federal assistance should be made through CEM.

13.3 Policy Issues and Recommendations

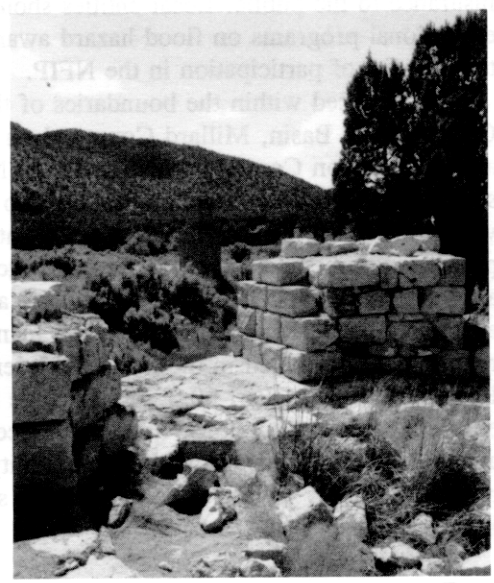
Policy issues regarding hazards, disasters and emergencies are discussed below. Local units of government have the prime responsibility for carrying out most of these issues. Refer to the *Utah State Water Plan* (1990), Section 13, for related issues and information.

13.3.1 Hazard Mitigation Plans

Issue - Hazard mitigation plans are needed to help protect life and property in communities.

Discussion - A hazard mitigation plan is a joint effort requiring input from each involved office or agency to list many of the hazards (natural and

■ Society must always be prepared to provide immediate response to any disaster or emergency. Preparedness is the key to alleviating traumatic experiences for those affected.



Old Iron Town

technological) facing a jurisdiction and outlining what strategies can be implemented to eliminate or lessen the impact from that hazard. These strategies are prioritized and include estimated costs and time frames to address the proposed mitigation.

Hazard mitigation may include structural and non-structural activities as they relate to flood prevention. Continued active involvement in the National Flood Insurance Program (NFIP) is essential to ensure adequate floodplain management objectives to reduce flood losses. Hazard mitigation plans can be implemented by communities to deal with identified hazards in the region such as flooding, earthquakes and hazardous materials.

The Division of Comprehensive Emergency Management performs functions relating to hazard mitigation plans at the state level. They are responsible to prepare, implement and maintain mitigation plans and programs.

Recommendation - Local towns, cities and counties should prepare hazard mitigation plans with assistance from the Division of Comprehensive Emergency Management.

13.3.2 Floodplain Management

Issue - Local governments need to become aware of their responsibilities as it relates to floodplain management.

Discussion - The National Flood Insurance Program (NFIP) was established by Congress in 1968 as a result of large federal outlays for structural measures and disaster relief. Its purpose is to (1) reduce flood loses, (2) prevent unwise development in floodplains, and (3) provide affordable flood insurance to the public. Local entities should conduct educational programs on flood hazard awareness and the benefits of participation in the NFIP.

As defined within the boundaries of the Cedar/Beaver Basin, Millard County, Iron County and Washington County participate in the NFIP. Four separate participating communities are also located within the basin. The basin has approximately 58 policies in force and a total dollar coverage of approximately $4,112,000. A community agrees to enact and enforce minimum floodplain management requirements as stated in the Code of Federal Regulation (CFR), Part 60.3. In exchange for enforcing these regulations, flood insurance is made available within the participating community. These regulations apply to new construction and substantial improvements.

The Division of Comprehensive Emergency Management is the State Coordinating Agency for the NFIP. The office can assist local participating communities in the implementation of the floodplain management objectives defined by the NFIP.

Also, the Corps of Engineers, through its Flood Plain Management Program, can develop flood plain boundary maps at no cost for those communities which need one or update those which do not adequately reflect current conditions.

Recommednation - Non-participating local entities should become qualified to participate in the National Flood Insurance Program. The Division of Comprehensive Emergency Management can assist communities in these objectives.

13.3.3 Disaster Response Plans

Issue - All communities should have a disaster response plan.

Discussion - Local governments need to increase their ability to respond to natural disasters and emergencies. Emergency Operations Plans (EOPs), also referred to as Disaster Response Plans, address disaster response and recovery activities following a disaster. These plans should be prepared ahead of time allowing counties, cities and towns to coordinate efforts and define responsibilities. Decisions should be made on leadership positions and activation of response activities. Millard, Beaver, Iron and Washington counties have EOPs in place. These plans identify hazards in the counties. They also can address disruption, contamination or exceptional shortfall in water supplies that can occur during emergency situations and may result in a temporary limitation of available water. When this happens, water deliveries may need to be prioritized in order to ensure critical needs are met first.

Emergency Action Plans (EAPs) have also been developed, or are in the process of being developed, for all dams in the state. The Division of Comprehensive Emergency Management reviews the private dam EAPs to ensure an adequate call down list is incorporated in the plan. This review is done in cooperation with the Office of the State Engineer, Dam Safety Section.

The Division of Comprehensive Emergency Management has the statewide responsibility of planning for, responding to, recovering from and mitigating emergencies. They have developed statewide plans for disaster response. This agency can assist local entities prepare response plans for emergency situations.

Recommendation - Local communities should develop disaster response plans with the assistance of the Division of Comprehensive Emergency Management.

13.3.4 Flood Prevention and Floodwater and Sediment Control

Issue - Measures need to be taken to prevent future damages from flooding problems.

Discussion - There are records of floods occurring since the earliest settlements in the basin. These floods have mostly damaged agricultural developments and facilities. In recent times, they have caused increasing damage to residential areas. Water control structures can be constructed for floodwater control and sediment storage or these features can be included in storage reservoirs constructed for other purposes. There are various other measures for controlling floodwater and sediment. These include non-structural and structural measures as well as proper management activities in the upper watershed areas. Cedar City is particularly vulnerable to flood damages. These damages could be reduced by floodplain zoning.

There are several state and federal agencies with programs and funding for floodwater and sediment control. These agencies should be consulted for assistance to local entities.

Recommendation - Counties should establish floodwater control committees to develop and carry out flood prevention plans and to assist other entities with flood problems. Appropriate state agencies should assist.

13.3.5 Droughts

Issue - Each county should have a drought response plan in place.

Discussion - Every part of the state has experienced droughts in the past and will continue to have them in the future. Drought cycles can be as short as one season or can last for several years. The affects of drought can be alleviated by preparing ahead of time. The most significant impacts will be on agriculture, culinary water supplies, tourism and wildlife. Electric power generation and water quality can also be affected. As the demand for water increases in the future, the impacts of drought may be more devastating and far reaching.

If drought plans are prepared, communities can be ready to deal with water shortages. Drought plans should establish priorities of water use and alternative sources of supply. Plans can also bring about the timely application of the resources available statewide.[20]

It may be desirable for two or more counties or parts of counties to join together and prepare one drought plan. This is particularly true where they are similar in climate and physiography as well as having similar socio-economic factors.

Recommendation - Each county should prepare or have available a drought response plan.

13.4 Local Organizational Structure

The cities and counties have primary responsibility for disaster response. This is particularly pointed out in Titles 10 and 17 of *Utah Code Annotated, 1953*, amended. Most entities have delegated disaster responsibilities to specific individuals in their respective organizations. The position responsible for disaster response in each county is shown in Table 13-1.

13.5 Water-Related Problems

Water-related problems are going to occur; it's just a matter of where and when. Preparing ahead of time can reduce the effects of disasters and emergencies, saving time, money, suffering and possibly even preventing loss of life.

13.5.1 Floodwater Problems

Flooding in the Cedar/Beaver Basin area is caused by three types of storms. One of these is the general winter storm occurring between November and April, producing the upper watershed snowpack. The other two are the general storms occurring between May and October and the summer thunderstorms which normally occur between July and October.

Sustained flooding is usually a result of extremely high snow packs in the upper watershed areas. Floods of this nature usually impact the Beaver River, Coal Creek, Parowan Creek, Red Creek and sometimes Little Creek. Higher peak flood flows are the result of local thunderstorms concentrating in smaller areas. These smaller flood producing areas are often localized in a small subwatershed of a larger watershed. These can effect the drainages mentioned above and in addition can cause damage in smaller watersheds such as Fiddlers Canyon, Holt Canyon, Spring Creek, Meadow Creek and Shoal Creek.

Natural and man-made obstructions such as bridges across streams, brush, large trees and other

Table 13-1 DISASTER RESPONSE RESPONSIBILITY	
County	Responsible Position
Beaver	Sheriff
Iron	Sheriff
Washington	Emergency Management Director

vegetation growing along streambanks in floodplain areas can also effect flooding. In general, obstructions restrict flood flows and can cause over-bank flows; unpredictable areas of flooding; destruction of or damage to bridges, homes and businesses; and increased flow velocity immediately downstream resulting in channel scouring.

In many years when floods were reported, several communities were affected. But many of the flood events were isolated, impacting only one or two areas. The highest recorded peak flow occurring on the Beaver River was on July 22, 1936, of 1,080 cfs and on Coal Creek on July 23, 1969, of 4,620 cfs. See Tables 5-4 and 5-5 for additional peak flows on these two streams.

On the afternoon of August 1, 1989, a storm yielded some 4-5 inches of rain in the Fiddlers Canyon area in an estimated 15 minutes. The Soil Conservation Service estimated the peak of the Fiddlers Canyon flash flood at 4,080 CFS. This event impacted numerous structures located on this alluvial fan.

Alluvial fan flooding is usually characterized by unpredictable flow paths and high velocities that occur with little advance warning time. Development pressure on alluvial fan areas is intensifying, creating a critical need to provide guidance to communities, developers and citizens on how to safely accommodate growth while protecting lives and property. Floods of the same or larger magnitude of those that have occurred in the past could take place in the future.

13.5.2 Droughts

The effects of droughts are accentuated with reduced amounts of precipitation. Also, most droughts seem to recur in somewhat regular cycles although of varying length and magnitude. This, coupled with the cyclic dry and wet periods, is a sure harbinger of periodic droughts.

Drought is a continuing problem because most of the basin is low in elevation with only the eastern rim, the Markagunt Plateau and the Tushar Mountains, rising high enough to have a major orographic effect. The relatively low snowpack limits the annual water yield rates along with corresponding streamflow volumes and groundwater aquifer recharge. Refer to Section 5, Water Supply and Use, for streamflow data and to Section 19, Groundwater, for aquifer information.

The relatively hot summer climate makes frequent irrigation of crops necessary. By mid-season, streamflows are low and in some cases, non-existent where there are no storage facilities. As a result, crops suffer. Even in the higher elevations, rangeland production of feed for livestock is reduced.

13.5.3 Other Water-Related Disaster Responses

There are other disasters where water supplies can be impacted. Generally these are more localized in nature than flooding or drought. These disasters include such things as structural failure of water supply facilities, toxic spills, landslides and earthquakes. Toxic spills are most likely to occur along highways such as those in Beaver Canyon, Coal Creek Canyon and Parowan Canyon. Coal Creek Canyon is especially vulnerable to landslides. The Hurricane, Paragonah and Beaver Basin fault zones are areas of high risk.

13.6 Flood Prevention and Drought Reduction Alternatives

For the most part, water storage reservoirs only have a moderate effect on the flood flows in major drainages. Their effect would be greater as the drainages become smaller. Studies should be made to determine the flood control possibilities of reservoirs on the major drainages where there are recurring floods. Recent studies of the Cedar/Beaver Basin, including Coal Creek, by the Corps of Engineers have determined flood control structures are not

economically justified from a federal perspective. However, local efforts should be undertaken as flood control funds become available. See Section 9.6.2 for data on potential reservoir sites that could include flood control features.

In conjunction with the flood control studies, investigations should be conducted in the upper watershed areas to determine the possibility of long-range flood reduction through installation of non-structural measures and applying good management activities. Floodplain management may be the most viable alternative where they serve as groundwater recharge zones. This is especially true in Coal Creek and Fiddlers Canyon.

The groundwater reservoirs could be managed to alleviate the impact of droughts. They can act as storage facilities, filled during the wetter cycles and used during the drier years to compensate for low streamflows.

The volume of precipitation can be increased by weather modification through cloud seeding. However, this requires the right conditions to be the most effective. During prolonged periods of drought, it may not be possible to significantly increase the precipitation. Generally, this is a viable alternative on a long-range continuing basis. By doing this, the upper watershed soil moisture will remain higher which will tend to moderate the effects of drought.

All of the groundwater reservoirs are currently being used to supplement the surface water inflows. This is less true in the Beaver Valley groundwater basin. See Section 5, Section 9.6.4 and Section 19 for information on groundwater.

13.7 Disaster Response Recommendations

It is always more effective to have plans and/or facilities in place prior to any disaster response requirements. There are several actions that could be put in place to alleviate disaster situations. Suggested actions include the following:

- Development of disaster response plans by individual communities and counties,
- Investigation and construction of water storage and floodwater prevention projects,
- Continuation of cloud seeding programs,
- Family emergency plans,
- An assessment of sediment/debris flows that would be expected after wildfires.

The Division of Comprehensive Emergency Management suggests all residents prepare a 72-hour emergency survival kit. According to experts in the field, this will allow adequate time for relief efforts to reach most residents. Along with preparing this kit, families should develop their own emergency plan outlining each member's responsibility during a disaster. Emergency preparedness drills are a good way to familiarize family members with their duties and help ensure the safety of each.

Hazard mitigation may include structural and non-structural activities as they relate to flood prevention. Continued active involvement in the National Flood Insurance Program is essential to ensure adequate floodplain management objectives are in place to reduce flood loses. Hazard mitigation plans can be implemented by communities to deal with specific identified potential disasters, such as flooding and alluvial fan development. ■ ■